CAG Meeting

March 11, 2019

Baseline Human Health Risk Assessment

- Baseline Human Health Risk Assessment (BHHRA) refers to a qualitative and/or quantitative evaluation of the actual or potential impacts of contaminants from a hazardous waste site on humans, under baseline (current) conditions, before any remedial actions are taken.

Baseline Human Health Risk Assessment

- The BHHRA answers the questions:
  - What are the risks to human health now, as the site currently exists and people currently use the site?
  - What are the risks to human health in the future, if no remedial action or cleanup in initiated, based on how the site is predicted to be used and people would access the site?
- The BHHRA estimates risk looking at cancer and non-cancer health endpoints.
- Completed in June 2014
- BHHRA updated via a memo in July 2018
  - Updated toxicity information for several chemicals, including PAHs
  - Revised exposure scenario for trespassers
  - Re-evaluation of lead in soil

Baseline Human Health Risk Assessment

EPA's 4-Step HHRA Procedure:

- Data Evaluation
  - Focuses the list of site-related chemicals that are detected at a site to those CERCLA hazardous substances that have the greatest potential to contribute to unacceptable health risks.
    - Involves factors such as the frequency of detection, the concentrations detected, and the potential to be associated with carcinogenicity.
- Exposure Assessment
  - Identifies the exposure populations and scenarios that currently exist and may potentially exist in the future.
    - Factors that are important include:
      - Ages of people being exposed
      - Route of exposure (ingestion, dermal contact, inhalation)
      - Frequency (days/year) and duration (years) of exposure
      - Contact rate (amount of soil ingested, amount of soil in contact with skin, amount of particles inhaled)

Baseline Human Health Risk Assessment

EPA's 4-Step BHHRA Procedure:

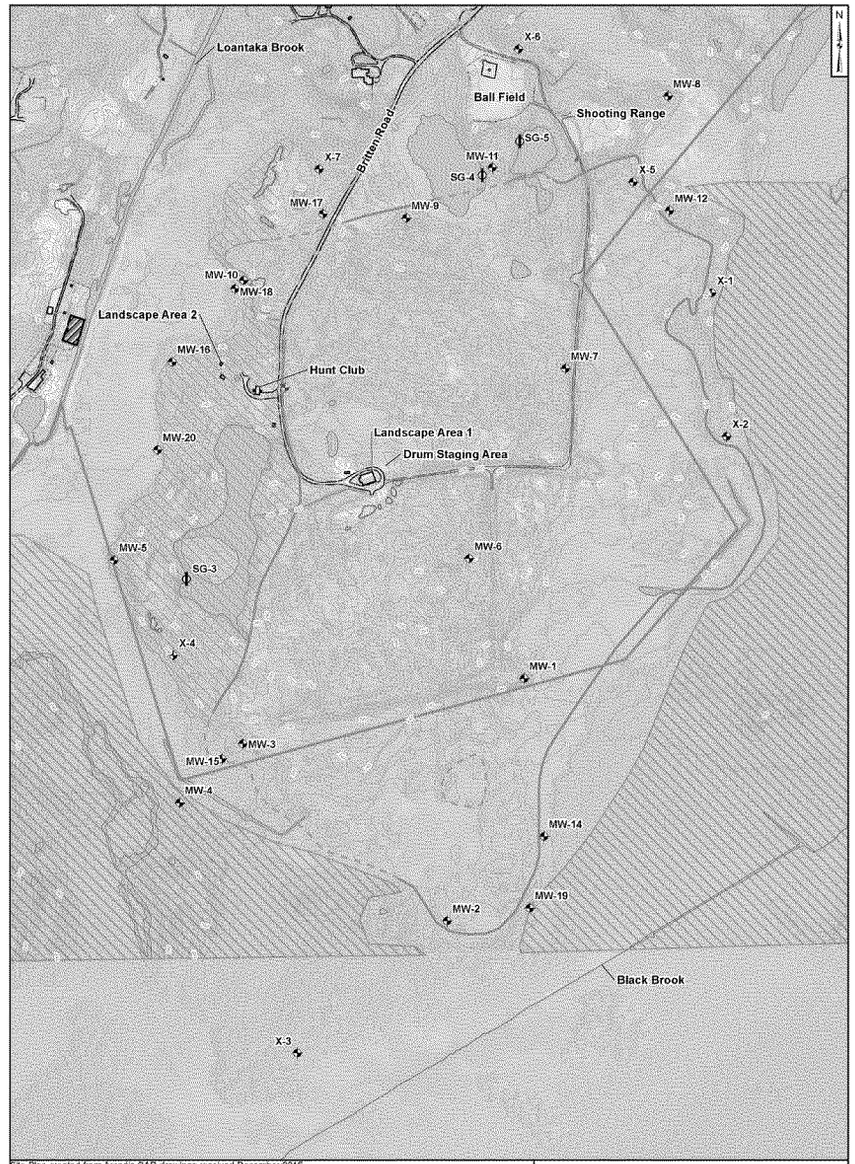
- Toxicity Assessment
  - What are the toxicity values from EPA approved databases
    - Cancer
    - Noncancer endpoints (neurological, liver, developmental, reproductive, other systemic effects)
- Risk Characterization
  - Looking at the previous three steps, what is the risk estimate:
    - Risk is a function of how toxic the chemical is (toxicity assessment) and exposure to the chemical (exposure assessment)
      - Risk = Toxicity x Exposure

Baseline Human Health Risk Assessment

Exposure scenarios evaluated:

- Current and reasonably anticipated future use scenario
  - A landscaper in Landscape Area 1
  - A landscaper in Hunt Club Area and Landscape Area 2
  - A Hunt Club user at the Hunt Club and Landscape Area 2
  - An adolescent and/or adult shooting range user at the shooting range
  - An adult ball player on the baseball field
  - An adolescent and/or adult trespasser on the Landfill

- Future On-Site Residential Development Scenario
  - A child and/or adult resident in the potentially developable area
  - A construction worker in the potentially developable area



Site Plan created from Arcadis CAD drawings received December 2015.
Aerial imagery accessed via ArcGIS Online and provided by the United States Department of Agriculture on 27 April 2017.
Image is dated 31 July 2015.

400 200 0 400 Feet

Legend

- Non-Potable Supply Well
- Monitoring Well Location
- Staff Gauge Location
- Edge of landfilled wastes (dashed where approximate)
- Great Swamp National Wildlife Refuge property boundary
- Areas where surface water flow does not exhibit typical bed and bank morphology
- Waste and debris observed on ground surface but not observed or anticipated below ground surface
- Off-site shooting range
- Open water

Site Plan

ROLLING KNOLLS LANDFILL SUPERFUND SITE
CHATHAM, NEW JERSEY

Geosyntec consultants

Princeton, NJ | April 2017

Figure **1-2**

Baseline Human Health Risk Assessment

- A formal reuse evaluation was conducted in 2017 to help understand anticipated future uses for the site.
- Informal discussions have been being held with the community and local stakeholders throughout the RI process.
- Both the formal evaluation and feedback received from the community suggest that there is strong support for limited future use, consistent with a passive recreational user: In July 2018, the approved 2014 human health risk assessment was updated to reflect this future use.
- Assumes adults and adolescents access the site 84 days per year.

Baseline Human Health Risk Assessment

Exposure scenario for an adolescent trespasser:

- Over a 12 year period (assumes ages 6 – 18)
- Access the area 84 days/year
  - 3 days/week in June, July and August when school is out of session.
    - 13 days/month in June, July and August: 39 days
  - 2 days/week in April, May, September, October and November when school is in session and the average high temperature is above 50 degrees F
    - 9 days/month in April, May, September, October and November: 45 days
  - No exposure during those months when the average high temperature is less than 50 degrees F (January, February, March and December)

Baseline Human Health Risk Assessment

For the reasonably anticipated future use:

- Cancer Risks posed by the site contamination do not exceed the acceptable risk range
- Noncancer Health Hazards slightly exceed the target value of 1:
  - Adolescent trespasser/limited recreational user - HI = 3
  - Adult trespasser/limited recreational user - HI = 2
  - Primarily driven by PCBs
- Lead concentrations are at levels that require remedial action

Baseline Human Health Risk Assessment

- The BHHRA identified unacceptable Noncancer Health Hazards
- The BHHRA identified lead at concentrations that that require remedial action

- The next step is to move into a Feasibility Study

Questions?